## CLAIMS

Sub A1

1. A method for storing data read from a primary memory device in a secondary memory device for a read/write access by a processing device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects and the data objects being stored at one or more data regions of the secondary memory device, the secondary memory device comprising a plurality of data storage sections each including one or more data regions, the method comprising the steps of:

determining for each data object an access frequency indicating a number of accesses in a unit time interval; and

storing data object whose access frequency falls in a predetermined access frequency range in data regions belonging to a same data storage section.

2. The method of claim 1, ***wherein***

each data storage section each data region has assigned to it a predetermined access frequency of said access frequency range, wherein said data objects are moved within said data storage region to data sections in accordance with said determined access frequency.

3. The method of claim 1, ***wherein***

said access frequency is stored together with said data object in said data region.

4. A method for storing data read from a primary memory device in a secondary memory device for a read/write access by a processing device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects and the data objects being stored at one or more data regions of the secondary memory device, the secondary memory device comprising a plurality of data storage sections each including one or more data regions, the method comprising the steps of:

determining for each data object an access frequency indicating a number of accesses in a unit time interval; and

storing data objects whose access frequency falls in a predetermined access frequency range in data regions belonging to a same data storage section; ***wherein***

said access frequencies of an access frequency range of an (i+1)-th data storage section are greater than said access frequencies of an i-th data storage section and each access frequency range comprises an upper and a lower access frequency threshold value,

a data object of said i-th data storage section is moved from the i-th to said (i+1)-th data storage section when said access frequency of said data object is greater than said upper access frequency threshold value and/or a data object of said (i-1)-th data storage section is moved from said (i+1)-th to said i-th data storage section when said access frequency of said data object is smaller than said lower access frequency threshold value.

5. The method of claim 4, ***wherein***

the secondary memory device comprises a first memory having a number J of first memory data storage sections and a second memory having a number I of second memory data storage sections, each data storage section having assigned a predetermined read access frequency range, and ***wherein***

a data object which is stored in said i-th second memory data storage section and whose access frequency exceeds said corresponding upper access frequency threshold value is moved to said (i-1)-th second memory data storage section or to a first memory data storage section of said first memory and/or a data object which is stored in an i-th second memory data storage section and whose access frequency is lower than said corresponding lower access frequency threshold value is moved to said (i-1)-th second memory data storage section or to a first memory data storage section of said first memory.

6. The method of claim 4, ***wherein***

said primary memory device is a disk memory, said data stored on said disk memory is data of a data base, said data blocks are pages of said data base, said data objects each comprise a plurality of data bytes, said secondary memory is a main memory of a data processor, said first memory of said main memory is a page cache memory and said second memory of said main memory is a resident data work memory.

7. The method of claim 6, ***wherein***

one part of data of a single record of said data base is stored in said page cache memory and another part of data is stored in said resident data work memory.

8. The method of claim 4, ***wherein***

said upper access frequency threshold value of an i-th data storage region (RDS-i) is identical to said lower access frequency threshold value of said (i+1)-th data storage region (RDS-i).

9. The method of claim 4, ***wherein***

said upper access frequency threshold value of said i-th data storage region is larger than said lower access frequency threshold value of said (i+1)-th data storage region such that a hysteresis is used when moving the data objects between said i-th and said (i+1)-th data storage section.

10. A method for storing data read from a primary memory device in a secondary memory device for a read/write access by a processing device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects and the data objects being stored at one or more data regions of the secondary memory device, the secondary memory device comprising a plurality of data storage sections each including one or more data regions, the method comprising the steps of:

determining for each data object an access frequency indicating a number of accesses in a unit time interval; and

storing data objects whose access frequency falls in a predetermined access frequency range in data regions belonging to a same data storage section; ***wherein***

said determined access frequency indicates said number of read accesses, write accesses or read & write accesses to a data object.

11. A method for storing data read from a primary memory device in a secondary memory device for a read/write access by a processing device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects and the data objects being stored at one or more data regions of the secondary memory device, the secondary memory device comprising a plurality of data storage sections each including one or more data regions, the method comprising the steps of:

determining for each data object an access frequency indicating a number of accesses in a unit time interval; and

storing data objects whose access frequency falls in a predetermined access frequency range in data regions belonging to a same data storage section; wherein

said access frequencies of an access frequency range of an (i+1)-th data storage section are greater than said access frequencies of an i-th data storage section and each access frequency range comprises an upper and a lower access frequency threshold value,

a data object of said i-th data storage section is moved from the i-th to said (i+1)-th data storage section when said access frequency of said data object is greater than said upper access frequency threshold value and/or

a data object of said (i+1)-th data storage section is moved from said (i+1)-th to said i-th data storage section when said access frequency of said data object is smaller than said lower frequency threshold value; ***wherein***

a physical reference is updated when said data object is moved from one data storage section to another data storage section.

12. The method of claim 11, ***wherein***

said physical reference is updated in an index structure.

13. The method of claim 11, ***wherein***

each data object comprises a first resident part containing attributes and second movable file content part, and ***wherein*** a physical reference contained in one of the attributes is updated when said file content of said data object is moved.

14. The method of claim 13, ***wherein***

said first resident part is located on said disc data base region and said movable file content part is located in said main memory.

15. A data processing device for processing data stored on a primary memory device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects, comprising:

a secondary memory device adapted to store the data objects at one or more data regions, said secondary memory device comprising a plurality of data storage sections each including one or more data regions;

a processing device comprising a read/write device adapted to read and write data objects from and to data regions of said secondary memory device; ***wherein***

said processing device further comprises:

an access frequency determining device adapted to determine for each data object stored in said data regions of said secondary memory device an access frequency indicating a number of accesses performed by said read/write device in a unit time interval; and

said read/write device is adapted for writing data objects whose determined access frequency falls in a predetermined access frequency range in data regions belonging to said same data storage section.

16. The device of claim 15, ***wherein***

in each data storage section each data region has assigned to it a predetermined access frequency of said access frequency range, and ***wherein*** said read/write device is adapted to move data objects within said data storage region to other data sections of said same data storage region in accordance with said determined access frequency.

17. The device of claim 15, ***wherein***

said read/write device is adapted to store said access frequency together with said data object in said data region.

18. The device of claim 15, ***wherein***

a reference updating device is adapted to physical reference when a data object is moved from one data storage section to another data storage section dependent on said access frequency.

19. A data processing device for processing data stored on a primary memory device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects, comprising:

a secondary memory device adapted to store the data objects at one or more data regions, said secondary memory device comprising a plurality of data storage sections each including one or more data regions;

a processing device comprising a read/write device adapted to read and write data objects from and to data regions of said secondary memory device; ***wherein***

said processing device further comprises:

an access frequency determining device adapted to determine for each data object stored in said data regions of said secondary memory device an access frequency indicating a number of accesses performed by said read/write device in a unit time interval; and

said read/write device is adapted for writing data objects whose determined access frequency falls in a predetermined access frequency range in data regions belonging to said same data storage section; and ***wherein***

said access frequencies of an access frequency range of an (i+1)-th data storage section are greater than said access frequencies of an i-th data storage section and each access frequency range comprises an upper and a lower access frequency threshold value,

said read/write device is adapted to move a data object of said i-th data storage section said i-th to said (i+1)-th data storage section when said access frequency of said data object is greater than said upper access frequency threshold value and/or

to move a data object of said (i+1)-th data storage section from said (i+1)-th to said i-th data storage section when said access frequency of said data object is smaller than said lower access frequency threshold value.

20. The device of claim 19, ***wherein***

said secondary memory device comprises a first memory having a number J of first memory data storage sections and a second memory having a number I of second memory data storage sections, each data storage section having assigned a predetermined access frequency range, and wherein said read/write device is adapted to move a data object which is stored in an i-th second memory data storage section and whose access frequency exceeds said corresponding upper access frequency threshold value to said (i+1)-th second memory data storage section or to a first memory data storage section of said first memory and/or to move a data object which is stored in an i-th second memory data storage section and whose access frequency is lower than said corresponding lower access frequency threshold value to said (i-1)-th second memory data storage section or to a first memory data storage section of said first memory.

21. The device of claim 19, ***wherein***

said primary memory device is a disk memory, said data stored on said disk memory is data of a data base, said data blocks are pages of said data base, said data objects each comprise a plurality of data bytes, said secondary memory is a main memory of a data processor, said first memory of said main memory is a page cache memory and said second memory of said main memory is a resident data work memory.

22. The device of claim 21, ***wherein***

one part of said data of a single record of said data base is stored in said page cache memory and another part of data is stored in said resident data work memory.

23. The device of claim 19, ***wherein***

said upper access frequency threshold value of said i-th data storage region is identical to said lower access frequency threshold value of said (i+1)-th data storage region.

24. The device of claim 19, ***wherein***

said upper access frequency threshold value of said i-th data storage region is larger than said lower access frequency threshold value of said (i+1)-th data storage region such that a hysteresis is used when moving said data objects between said i-th and said (i+1)-th data storage section.

25. A data processing device for processing data stored on a primary memory device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects, comprising:

a secondary memory device adapted to store the data objects at one or more data regions, said secondary memory device comprising a plurality of data storage sections each including one or more data regions;

a processing device comprising a read/write device adapted to read and write data objects from and to data regions of said secondary memory device; ***wherein***

said processing device further comprises:

an access frequency determining device adapted to determine for each data object stored in said data regions of said secondary memory device an access frequency indicating a number of accesses performed by said read/write device in a unit time interval; and

said read/write device is adapted for writing data objects whose determined access frequency falls in a predetermined access frequency range in data regions belonging to said same data storage section; and wherein

said determined access frequency indicates said number of read accesses, write accesses or read & write accesses to a data object.

26. A data base system comprising a primary memory device on which data of the data base system is stored and a data processing device for processing data stored on the primary memory device, the data in the primary memory device being organized as a plurality of data blocks each consisting of one or more data objects, comprising:

a secondary memory device adapted to store the data objects at one or more data regions, said secondary memory device comprising a plurality of data storage sections each including one or more data regions;

a processing device comprising a read/write device adapted to read and write data objects from and to data regions of said secondary memory device; ***wherein***

said processing device further comprises:

an access frequency determining device adapted to determine for each data object stored in said data regions of said secondary memory device an access frequency indicating a number of accesses performed by said read/write device in a unit time interval; and

said read/write device is adapted for writing data objects whose determined access frequency falls in a predetermined access frequency range in data regions belonging to said same data storage section.